# NSBF Conventional Electronics Interconnection
## Interconnection for Conventional Balloon Flights

1. Commanding:

   CIP Commanding utilizes a 16-bit data word and 77 available discreet commands (10 through 5C hexadecimal). These commands are accessible on the CIP J-2 connector (depicted in Figure 1 (Picture) and Figure 2 (Pin-Out)) as open collector outputs with a maximum rating of 500ma continuous and maximum 50V pull-up voltage (an in-line current limiting resistor is also required). The computer output data stream to the NSBF GSE computer is also specified in the Conventional GSE Science Command Interface PDF file available on the NSBF Web Page under Documents at the following URL;
   http://www.nsbf.nasa.gov/Conventional_GSE_SCI_CMD.pdf.

**Commanding Format:**

The scientist may send commands to the flight computer by complying with the following instructions:

A. An RS-232 port must be provided and set up in the following manner:

1200 Baud, no parity, 8 bits, 1 stop bit or; 1200, N, 8,

B. A command equals:

  Letter "S"

  Command equals four characters
  Space
  Address equals two characters
  Letter "K" (DISCRETE) or "W" (DATA WORD)
  Repeat above twice
  Carriage return (#13)
  Line feed (#10)

EXAMPLE: To send discrete command 23, address 12: the following would be sent:

  S0023*12KS0023*12KS0023*12K<CR><LF>

EXAMPLE: To send the data word command AB03, address 12: the following would be sent:

 SABO3*12WSAB03*12WSAB03*12W<CR><LF>

C. The flight computer command management system will return AADD/COMMAND/TIME CR LF" if the command is successfully sent.

D. **Addresses** 10 through 1F (Hexadecimal) are available as are **commands** 10 through 5C (Hexadecimal). Commands or addresses outside these constraints will generate appropriate error messages.

E. The discrete commands are now in Hexadecimal.

F. The discrete commands are set up to output a "low" (which is an activated open collector driver) when the command is sent.

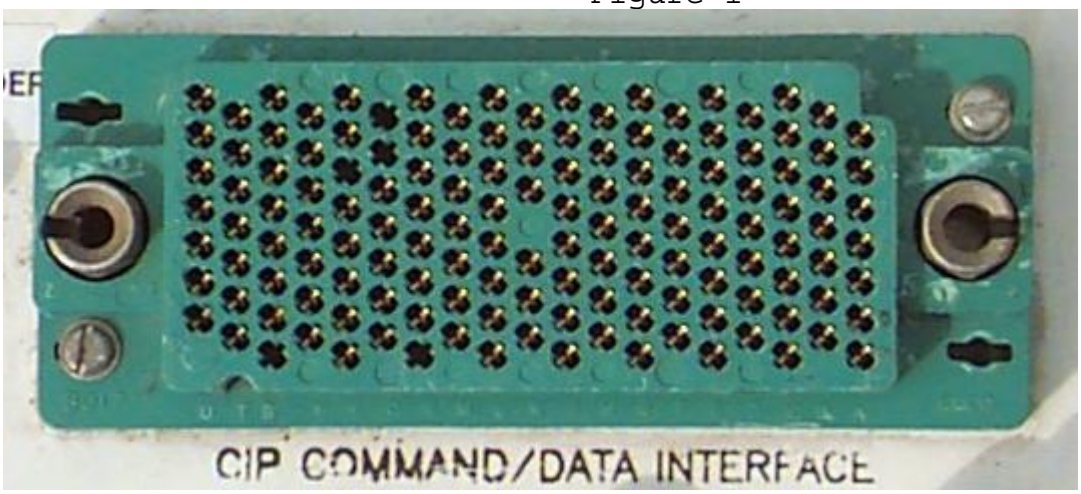
G. The Data Word is set up to output a "high" (a non-activated open collector driver) when the Data Word bit is sent true or "high"; for example if all bits are sent true with a Data Word Command FFFF all bits would be seen as "high" with non-activated open collector drivers.

H. The Data Word bits are on J-2 and pins A3 through C3, the strobelo pulse is on J2 pin C5 with the strobehi pulse residing on J2 pin C7. Two Data Word Strobes are also available for use on the CIP J-2 Elco connector, strobelo and strobehi. Strobelo is a 1 millisecond negative going pulse, strobehi is a 1 millisecond positive going pulse and they activate when a Data Word command has been received and the output bits have been set to enable the scientist to "strobe in" their data.

2. Voltage Control Oscillators are available in Standard IRIG channels 1,3,5,7,8,9,,B,E,and HH. Input impedance is 500 Kohms for channels 1 through 9 and 250 Kohms for channels B,E, and HH.

3. Two types of Telemetry Transmitters are available for use. The first type of Telemetry Transmitter is a "Digital" transmitter which requires a 0V to +5V input and the second type of Telemetry transmitter must be provided with a bipolar input the amplitude of which is dependant upon the bit-rate being used.

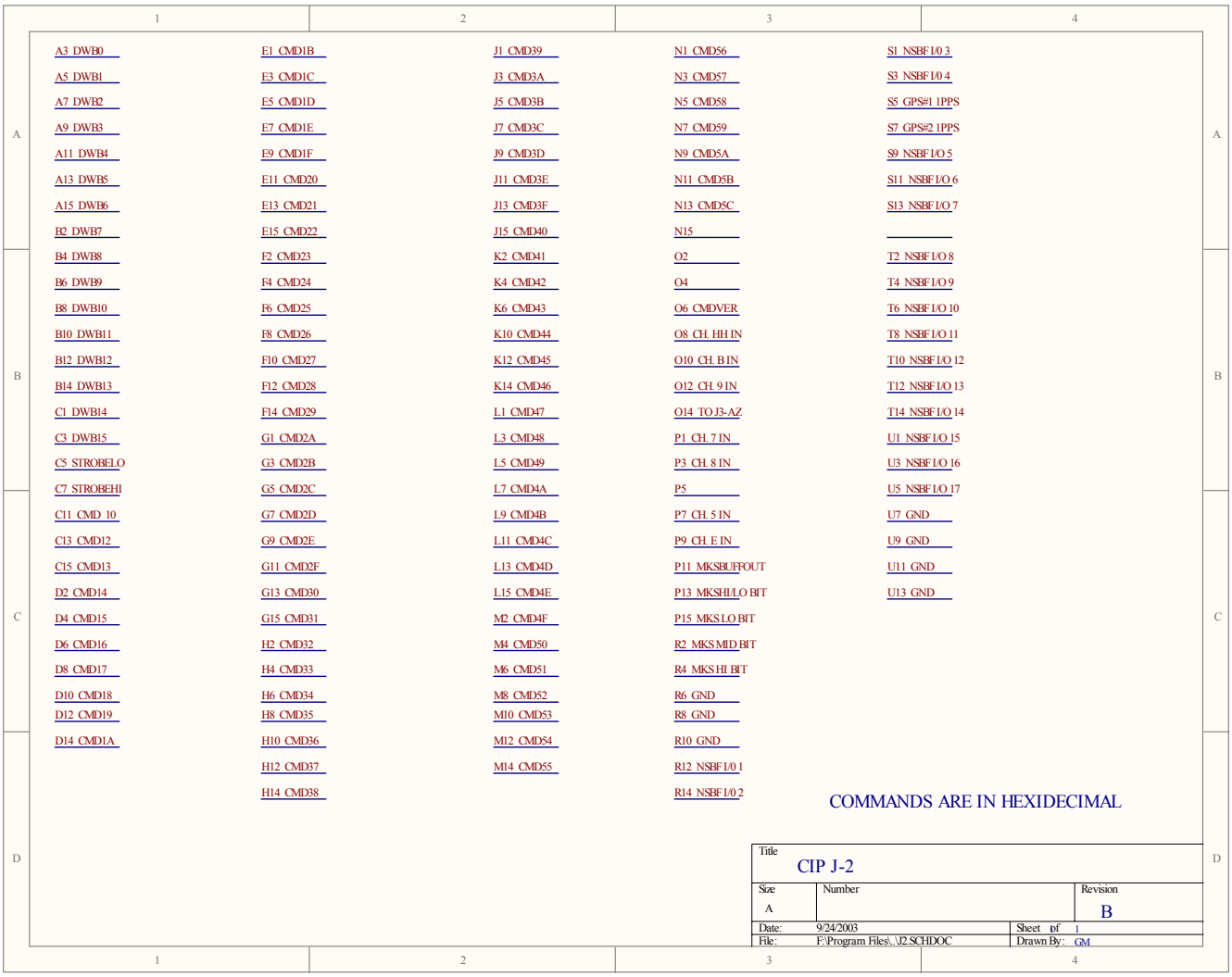
Figure 1




CIP J-2 120-Pin Elco Connector

# NSBF Conventional Electronics Interconnection

Figure 2
Pin-Out of CIP J-2 120 Pin Connector




Elco Pins can be ordered from Newark;
Manufacturers number 516-290-590
Newark number 13H6679

GM 10-2-2003